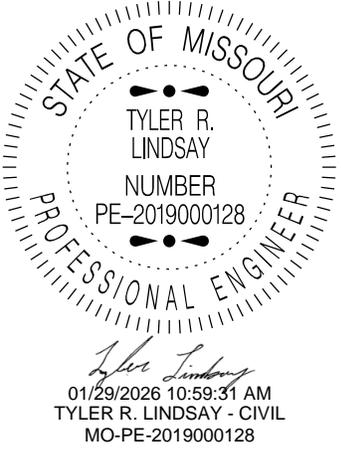


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	If a seal is present on this sheet, JSP's has been electronically sealed and dated.
	JOB NO. J4P3093 Various Counties, MO Date Prepared: 1/29/2026
Only the following items of the Job Special Provisions (Bridge) are authenticated by this seal: A, B, C, E & F	

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	If a seal is present on this sheet, JSP's has been electronically sealed and dated.
	JOB NO. J4P3093 Various Counties, MO Date Prepared: 1/29/2026
	Only the following items of the Job Special Provisions (Bridge) are authenticated by this seal: A-D

JOB SPECIAL PROVISIONS (BRIDGE)

A. CONSTRUCTION REQUIREMENTS

1.0 Description. This provision contains general construction requirements for this project.

2.0 Construction Requirements. The plans and the asbestos and lead inspection report(s) for the existing structure(s) are included in the contract in the bridge electronic deliverables zip file for informational purposes only.

2.1 In order to assure the least traffic interference, the work shall be scheduled so that the bridge closure is for the absolute minimum amount of time required to complete the work. The bridge shall not be closed until material is available for continuous construction and the contractor is prepared to diligently pursue the work until the closed bridge is opened to traffic.

2.2 Bridge work by contractor forces, including erection, rehabilitation or demolition, shall not be allowed over traffic unless a bridge platform protection system is installed below the work area except for work performed above a deck that is intact. The protection system shall be capable of catching all falling objects such as tools, overhang brackets or materials. Lifting of objects that are heavier than the capacity of the bridge protection system shall not be permitted.

2.3 Qualified special mortar shall be a qualified rapid set concrete patching material in accordance with [Sec 704](#). A qualified rapid set concrete patching material will not be permitted for half-sole repair, deck repair with void tube replacement, full depth repair, modified deck repair and substructure repair (formed) unless a note on the bridge plans specifies that a qualified special mortar may be used.

2.4 Provisions shall be made to prevent any debris and material from falling onto the roadway. If determined necessary by the engineer, any debris and material that falls below the bridge outside the previously specified limits shall be removed as approved by the engineer at the contractor's expense. Traffic under the bridge shall be maintained in accordance with the contract documents.

2.5 Any damage sustained to the remaining structure as a result of the contractor's operations shall be repaired or the material replaced as approved by the engineer at the contractor's expense.

2.6 Provisions shall be made to prevent damage to any existing utilities. Any damage sustained to the utilities as a result of the contractor's operations shall be the responsibility of the contractor. All costs of repair and disruption of service shall be as determined by the utility owners and as approved by the engineer.

2.7 The contractor shall provide steel plates over any unprotected open excavation in the bridge deck during non-working hours and in areas where work is not active. The plates shall be 3/4 inch thick. The plates shall extend 12 to 18 inches each side of the opening and cover the full width of work. The contractor shall bevel all edges to a slope no steeper than 3H:1V. The driving surface shall be treated for skid resistance either by surface deformation or direct application of a friction course and delineated as shown in the plans. The plates shall be securely affixed to the deck using concrete anchors or through bolts. The contractor may also secure the plate by attaching it to the superstructure or substructure. However, nothing shall be welded or bolted to these elements. The method of attachment shall be approved by the engineer. Any damage to the deck, superstructure, or substructure as a result of this work shall be repaired as approved by the engineer at the contractor's expense.

JOB SPECIAL PROVISIONS (BRIDGE)

2.8 No heavy equipment will be allowed under the north side of Bridge No. A5260. If ground access is required to complete substructure repairs and application of protective coating at Int. Bent No. 4 is needed, only hand tools, ladders, scaffolding or low impact equipment will be allowed.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for other items included in the contract.

B. RAPID SET CONCRETE PATCHING MATERIAL – VERTICAL AND OVERHEAD REPAIRS

1.0 Description. This specification covers cementitious concrete, polymer-modified concrete and polymer concrete that are suitable for repairing concrete surfaces on bridges or concrete structures, particularly under fast setting or special conditions. The repairs would involve vertical or overhead applications. The work shall consist of removing, furnishing, preparing, and placing materials at locations as shown on the plans or as directed by the engineer.

2.0 Material. All materials shall be in accordance with MoDOT specifications and as noted herein.

2.1 Aggregate. For Extending Commercial Mixture. Coarse and fine aggregates shall be in accordance with [Sec 1005](#), except the requirements for gradation and percent passing the No. 200 sieve shall not apply. Coarse aggregate meeting Gradation E requirements shall be used for repairs greater than one inch (25 mm) in depth. Fine aggregate will be allowed for repairs less than one inch (25 mm). Aggregate specified, bagged, labeled and furnished by the rapid set concrete patching material manufacturer may also be used for mortar extension.

2.2 Material Applications. The contractor shall select and use the product most suitable for the work and field conditions in accordance with these specifications.

2.3 Curing. Rapid set concrete patching material shall be cured until the minimum compressive strength 1500 psi is attained using standard curing specifications, unless otherwise specified by the manufacturer.

2.4 Qualification and Project Acceptance.

2.4.1 Inspection. All materials shall be subject to inspection and sampling by MoDOT at the source of manufacture, intermediate shipping terminal or destination. MoDOT will be allowed free access to all facilities and records as required to conduct inspection and sampling.

2.4.2 Qualification. Prior to use, rapid set concrete patching materials need to be qualified.

2.4.2.1 Requested Information. The manufacturer shall submit with samples of the materials, a written request to Construction and Materials with the following information:

- (a) New Products Evaluation Form
- (b) Brand name of the product.

JOB SPECIAL PROVISIONS (BRIDGE)

- (c) Certification that the material meets this specification.
- (d) Certified test results from an independent laboratory showing compliance with this specification.
- (e) Specific preparation instructions of repair area.
- (f) Specific mixing, handling and curing instructions.
- (g) Application type (i.e., vertical or overhead).

2.4.2.2 Field Evaluation. Final approval will be granted when the following requirements are met:

- (a) MoDOT report documenting two years of field performance on MoDOT system. The report will contain the placement date, field observations (semi annual), description of field performance and photographs of in-place material.
- (b) A manufacturer's representative shall be present during placement of the material to provide technical expertise.

2.4.2.2.3 Disqualification. If during the two year observation period the repair area(s) fails the product will not be added to the qualified list.

2.5 Qualified List. The listing of qualified products are available from Construction and Materials or on MoDOT's web site. New certified test results and samples shall be submitted any time the manufacturing process or the material formulation is changed. The material will be subject to removal from the qualified list if there is evidence of unsatisfactory performance or a change in manufacturing process or formulation, or when random sampling and testing of material offered for use indicates nonconformity with any of the requirements herein specified.

2.6 Certification. The contractor shall supply a manufacturer's certification to the engineer for each lot of material furnished. The certification shall include the name of the manufacturer, a manufacturer certification statement that the material supplied is the same as that qualified and listing the date of qualification.

2.7 Acceptance. Acceptance of the material will be based on the use of a qualified product, the manufacturer's certification that the material supplied is the same as that approved and upon the results of such tests as may be performed by the engineer.

3.0 Mixture. Unless otherwise specified, rapid set concrete patching material shall be approved commercial mixtures meeting [Sections 3.1 – 3.1.3.](#) Rapid set concrete patching materials shall be specifically designed for the application needed.

3.1 Commercial Mixtures. Rapid set concrete patching material in its sacked form and mixtures when properly prepared in accordance with the manufacturer's specifications, shall meet the minimum test requirements given in Table 1. Mixtures may be supplied, as required, as a patching mortar or as a patching mortar with aggregate extension. If the material is to be supplied with extender aggregate, this shall also pass the required tests in Table 1 using the maximum allowed amount of extender aggregate.

JOB SPECIAL PROVISIONS (BRIDGE)

3.1.1 Mixture Requirements. Rapid set concrete patching material shall be single packaged dry mix requiring the addition of water or other liquid component just prior to mixing. The material shall not contain soluble chlorides as an ingredient of manufacture. The material shall be placed in accordance to the manufacturer's recommendations.

Table 1 (English Unit)				
Physical Test Property	Specification	Requirement for cementitious concrete	Requirement for polymer-modified concrete	Requirement for polymer concrete
Bond Strength by Slant Shear	ASTM C882/C928 ²	min. 1000 psi @ 24hrs. & min. 1500 psi @ 7 days	n/a	min. 1000 psi @ 24hrs. & min. 1500 psi @ 7 days
Linear Coefficient of Thermal Expansion ¹ (for bagged mortar only, without extension aggregate)	ASTM C531	n/a	n/a	4 – 8 X 10 ⁻⁶ in/in/deg F
Resistance to Rapid Freezing & Thawing	AASHTO T161 or ASTM C666	80% min. using Procedure B ³ (300 Cycles)	80% min. using Procedure B ³ (300 Cycles)	n/a
Compressive Strength	AASHTO T22 or ASTM C39	1500 psi @ 3 hr & 3000 psi @ 24 hr	1500 psi @ 3 hr & 3000 psi @ 24 hr	n/a
Rapid Chloride Permeability	AASHTO T277 or ASTM C1202	1000 coulombs @ 28 days	1000 coulombs @ 28 days	1000 coulombs @ 28 days
Length Change	AASHTO T 160 or ASTM C157	In water Storage (+0.15) In air storage (-0.15)	In water storage (+0.15) In air storage (-0.15)	n/a
Color		gray	gray	gray

¹ Not required for extended mixtures if the mortar passes this requirement.
² ASTM C882 shall be performed on non-water based materials. ASTM C928 shall be performed on water-based materials.
³ Procedure A may be used in lieu of Procedure B

3.1.2 Construction Requirements. The manufacturer shall provide with the bagged mixture, specifications for the mixing procedure, amount and kind of liquid to be added, and the amount of aggregate extension allowed, if any. All mixing, handling and curing practices recommended by the manufacturer shall be followed and will be considered a part of these specifications.

3.1.3 Removal from Qualified List. All mixtures shall be approved before use. Reoccurring failures of any mixture for any reason will be cause for removal from the qualified list.

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3.2 Vertical Repair. A qualified rapid set concrete patching material approved for vertical use may be used when specified on the plans and as approved by the engineer. The engineer will make field cylinders to verify the 1500 psi (10 MPa) minimum strength. The material shall adhere to the concrete surface without sagging.

3.3 Overhead Repair. A qualified rapid set concrete patching material approved for overhead use may be used when specified on the plans and as approved by the engineer. The material shall be placeable in layers of at least 1 inch on overhead applications without the use of formwork or anchoring devices. The material shall adhere to the concrete surface without sagging. The engineer will make field cylinders to verify the 1500 psi (10 MPa) minimum strength.

4.0 Construction Requirements.

4.1 Mixing. Rapid set concrete patching material shall be mixed and finished according to the manufacturer's recommendation.

4.2 Preparation of Repair Area. Deteriorated, damaged or defective concrete as shown on the plans, required by the specifications or as directed by the engineer, shall be removed. All exposed reinforcement shall be thoroughly cleaned as shown on the plans, required by the specifications or as directed by the engineer. Unless otherwise specified by the commercial mixture manufacturer, the existing surface shall be damp and all free water shall be removed prior to placement of the required material.

4.3 Bonding Agent. A bonding agent may be used if recommended by the rapid set concrete patching material manufacturer.

5.0 Method of Measurement. No measurement will be made for rapid set concrete patching material.

6.0 Basis of Payment. Rapid set concrete patching material will be paid for at the contract unit price for other items and will be considered full compensation for all labor, equipment and material to complete the described work.

C. RAPID SET CONCRETE PATCHING MATERIAL – HORIZONTAL REPAIRS

1.0 Description. This specification covers cementitious concrete, polymer-modified concrete and polymer concrete that are suitable for repairing concrete surfaces on bridges or roadways, particularly under fast setting or special conditions. The repairs would involve horizontal applications. The work shall consist of removing, furnishing, preparing, and placing materials at locations as shown on the plans or as directed by the engineer.

2.0 Material. All materials shall be in accordance with MoDOT specifications and as noted herein.

2.1 Aggregate For Extending Commercial Mixture. Coarse and fine aggregates shall be in accordance with [Sec 1005](#), except the requirements for gradation and percent passing the No. 200 sieve shall not apply. Coarse aggregate meeting Gradation E requirements shall be used for repairs greater than one inch (25 mm) in depth. Fine aggregate will be allowed for repairs less than one inch (25 mm). Aggregate specified, bagged, labeled and furnished by the rapid set concrete patching material manufacturer may also be used for mortar extension.

JOB SPECIAL PROVISIONS (BRIDGE)

2.2 Material Applications. The contractor shall select and use the product most suitable for the work and field conditions in accordance with these specifications.

2.3 Curing. Rapid set concrete patching material shall be cured until the minimum compressive strength 3200 psi is attained using standard curing specifications, unless otherwise specified by the manufacturer.

2.4 Qualification and Project Acceptance.

2.4.1 Inspection. All materials shall be subject to inspection and sampling by MoDOT at the source of manufacture, intermediate shipping terminal or destination. MoDOT will be allowed free access to all facilities and records as required to conduct inspection and sampling.

2.4.2 Qualification. Prior to use, rapid set concrete patching material shall be qualified. In order to become qualified, a material shall have completed testing through AASHTO's National Transportation Product Evaluation Program (NTPEP). The manufacturer shall contact the AASHTO/NTPEP coordinator to obtain the testing location for the rapid setting concrete patching material.

2.4.2.1 Requested Information. The manufacturer shall submit with samples of the materials, a written request to Construction and Materials with the following information:

- (a) Brand name of the product.
- (b) Certification that the material meets this specification.
- (c) NTPEP test results showing compliance with this special provision.
- (d) Specific mixing, handling and curing instructions.
- (e) Application type (i.e., bridge or roadway).

2.4.2.2 Qualified List. Upon approval by the engineer, the brand name and manufacturer will be placed on a qualified list of rapid set concrete patching materials. The listing of qualified materials is available from Construction and Materials or on MoDOT's web site. New certified test results and samples shall be submitted any time the manufacturing process or the material formulation is changed. The material will be subject to removal from the qualified list if there is evidence of unsatisfactory performance or a change in manufacturing process or formulation, or when random sampling and testing of material offered for use indicates nonconformity with any of the requirements herein specified.

2.4.3 Provisional Approval. Provisional approval may be granted provided the following requirements have been met:

- (c) New Products Evaluation Form
- (d) Certified test results from an independent laboratory showing compliance with this special provision.
- (e) Documentation prepared by MoDOT covering two years of field performance on MoDOT's system. MoDOT will need to approve the location of the test site.

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Documentation will contain the placement date, field observations (semi annual), description of field performance and photographs of in-place material.

- (f) During placement the manufacturer’s representative shall be present on the project to provide technical expertise.

2.4.3.1 Disqualification. If during the two year observation period the repair area(s) fails provisional approval will not be granted. Repair area(s) experiencing any cracking, debonding or spalling will be considered a failure.

2.4.3.2 Length of Provisional Approval. Provisional approval will be granted for three years or until NTPEP testing is completed.

2.5 Certification. The contractor shall supply a manufacturer's certification to the engineer for each lot of material furnished. The certification shall include the name of the manufacturer, a manufacturer certification statement that the material supplied is the same as that qualified and listing the date of qualification.

2.6 Acceptance. Acceptance of the material will be based on the use of a qualified or provisionally approved material, the manufacturer's certification that the material supplied is the same as that approved and upon the results of such tests as may be performed by the engineer.

3.0 Mixture. Unless otherwise specified, rapid set concrete patching material shall be approved commercial mixtures meeting [Sections 3.1 – 3.1.3](#) or deck repair cementitious mortar meeting [Section 3.2](#). Rapid set concrete patching materials shall be specifically designed for the application needed.

3.1 Commercial Mixtures. Rapid set concrete patching material in its sacked form and mixtures when properly prepared in accordance with the manufacturer’s specifications, shall meet the minimum test requirements given in Table 1. Mixtures may be supplied, as required, as a patching mortar or as a patching mortar with aggregate extension. If the material is to be supplied with extender aggregate, this shall also pass the required tests in Table 1 using the maximum allowed amount of extender aggregate.

3.1.2 Mixture Requirements. Rapid set concrete patching material shall be single packaged dry mix requiring the addition of water or other liquid component just prior to mixing. The material shall be capable of ½ inch (13 mm) to full depth repair and require no bonding agent. The material shall not contain soluble chlorides as an ingredient of manufacture. The material shall be placed in accordance to the manufacturer's recommendations.

Table 1 (English Unit)				
Physical Test Property	Specification	Requirement for cementitious concrete	Requirement for polymer-modified concrete	Requirement for polymer concrete
Bond Strength by Slant Shear ¹	ASTM C882/C928 ³	min. 1000 psi @ 24hrs.& min. 1500 psi @ 7 days	n/a	min. 1000 psi @ 24hrs.& min. 1500 psi @ 7 days

JOB SPECIAL PROVISIONS (BRIDGE)

Linear Coefficient of Thermal Expansion ^{1, 2} (for bagged mortar only, without extension aggregate)	ASTM C531	n/a	n/a	4 – 8 X 10 ⁻⁶ in/in/deg F
Resistance to Rapid Freezing & Thawing ¹	AASHTO T161 or ASTM C666	80% min. using Procedure B ⁵ (300 Cycles)	80% min. using Procedure B ⁵ (300 Cycles)	n/a
Compressive Strength ¹	AASHTO T22 or ASTM C39	3200 psi @ 3 hr & 4000 psi @ 7 days	3200 psi @ 3 hr & 4000 psi @ 7 days	n/a
Rapid Chloride Permeability ¹	AASHTO T277 or ASTM C1202	<u>Bridge Decks</u> 1000 coulombs @ 28 days <u>Roadway</u> 2000 coulombs @ 28 days	<u>Bridge Deck</u> 1000 coulombs @ 28 days <u>Roadway</u> 2000 coulombs @ 28 days	<u>Bridge Deck</u> 1000 coulombs @ 28 days <u>Roadway</u> 2000 coulombs @ 28 days
Length Change ^{1, 4}	AASHTO T 160 or ASTM C157	In water Storage (+0.15) In air storage (-0.15)	In water storage (+0.15) In air storage (-0.15)	n/a
Color		gray	gray	gray

¹The commercial mix test values can be located in the AASHTO's National Transportation Product Evaluation Program (NTPEP) reports for Laboratory Evaluations of Rapid Set Concrete Patching Materials. Data for provisionally approved materials is located at the Construction and Materials Division.

²Not required for extended mixtures if the mortar passes this requirement.

³ ASTM C882 shall be performed on non-water based materials. ASTM C928 shall be performed on water-based materials.

⁴ As modified by ASTM C928.

⁵ Procedure A may be used in lieu of Procedure B

3.1.2 Construction Requirements. The manufacturer shall provide with the bagged mixture, specifications for the mixing procedure, amount and kind of liquid to be added, and the amount of aggregate extension allowed, if any. All mixing, handling and curing practices recommended by the manufacturer shall be followed and will be considered a part of these specifications.

3.1.3 Removal from Qualified List. All mixtures shall be approved before use. Reoccurring failures of any mixture for any reason will be cause for removal from the qualified list.

3.2 Deck Repair Concrete. A qualified rapid set concrete patching material indicated for horizontal use and intended for patching concrete bridge decks may be used when specified on the plans and as approved by the engineer. If this option is selected, the contractor shall provide a trial mix to determine the total cure time needed to achieve a compressive strength of 3200 psi (22 MPa). Compressive specimens shall be prepared in accordance with current MoDOT test methods and cured to simulate actual field conditions. Testing of compressive specimens shall be performed by methods and at facilities acceptable to the engineer. The repaired deck shall not be opened to traffic until at least 4 hours after the last placement of deck repair concrete, the

JOB SPECIAL PROVISIONS (BRIDGE)

established cure time has elapsed and until such concrete has achieved a compressive strength of 3200 psi (22 MPa). A new trial mix may be required if the engineer determines the field conditions vary substantially from trial mix conditions. The engineer will make field cylinders to verify the 3200 psi (22 MPa) minimum strength.

4.0 Construction Requirements.

4.1 Mixing. Rapid set concrete patching material shall be mixed and finished according to the manufacturer's recommendation.

4.2 Preparation of Repair Area. Deteriorated, damaged or defective concrete as shown on the plans, required by the specifications or as directed by the engineer, shall be removed. All exposed reinforcement shall be thoroughly cleaned as shown on the plans, required by the specifications or as directed by the engineer. Unless otherwise specified by the commercial mixture manufacturer, the existing surface shall be damp and all free water shall be removed prior to placement of the required material.

4.3 Bonding Agent. A bonding agent may be used if recommended by the rapid set concrete patching material manufacturer.

5.0 Method of Measurement. No measurement will be made for rapid set concrete patching material.

6.0 Basis of Payment. Rapid set concrete patching material will be paid for at the contract unit price for other items and will be considered full compensation for all labor, equipment and material to complete the described work.

D. EPOXY URETHANE POLYMER WEARING SURFACE WITH HEALER/SEALER

1.0 Description. This work shall consist of constructing an epoxy urethane polymer wearing surface on a prepared surface in accordance with this specification, as shown on the plans or as directed by the engineer. Epoxy urethane polymer wearing surface shall be composed of the following components: a healer/sealer prime coat and two courses of epoxy urethane polymer and aggregate.

1.1 Required Experience. The contractor shall have experience placing similar epoxy urethane polymer wearing surface systems on at least three structures prior to performing work on this project. Written proof of this experience along with project contacts shall be provided to the engineer in writing for approval prior to the preconstruction meeting. Prior to installation of the wearing surface, the contractor shall also provide certification by the material supplier that the contractor is a trained and qualified installer of the selected wearing surface system.

2.0 Material. All material shall be in accordance with [Division 1000](#), Material Details, and specifically as follows:

2.1 Epoxy Urethane Resin. The infrared spectrum for each component of the epoxy urethane polymer shall essentially match that of the standard infrared spectrum for the particular component as specified in AASHTO T 237, Sections 4 and 5. The epoxide equivalent for Component A shall not exceed 270. The mixed epoxy urethane polymer shall be a two-component (base and hardener), 100% solids, thermosetting, moisture insensitive, flexible, high elongation epoxy urethane resin in accordance with the following physical requirements:

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Property	Requirement
Pot life (at 75 F), minutes	15 to 45
Tensile Strength (at 75 F, 7 days), psi, min.	2500
Tensile elongation (at 75 F), percent, min.	30
Water Absorption, percent, max.	1
Compressive Strength (at 3 hr), psi, min.	1000
Compressive Strength (at 24 hr, wet), psi, min.	5000
Rotational Viscosity, (at 75 F, spindle 3, 20 rpm), poise	35 to 70
Thermal Shear (shearing, shrinkage, expansion or scaling)	None
Shore D Hardness (ASTM D 2240) (at 77 F)	60 to 75
Adhesion Strength (at 24 hr), psi, min.	250

2.1.1 Classes. Epoxy resin shall be formulated for use at specific temperatures as specified in ASTM C 881. The controlling temperature shall be that of the hardened concrete surface to which the polymer is applied. Where unusual curing rates are desired and upon the approval from the engineer, a class of epoxy resin may be used at a temperature other than that for which the epoxy resin is normally intended.

2.1.2 Packaging. Containers shall be identified as "Component A--Contains Epoxy Resin" and "Component B--Contains Hardener" and shall show the type, class and mixing directions. Each container shall be marked with the name of the manufacturer, class, batch, or lot number, date of packaging, date of shelf life expiration, pigmentation (if any), manufacturer, and the quantity contained in pounds and gallons.

2.2 Prime Coat. The prepared surface shall receive a healer/sealer prime coat, as specified on the plans or as recommended by the manufacturer, that is compatible with the wearing surface system selected.

2.3 Aggregate. Aggregate shall be bauxite, crushed porphyry, aluminum oxide, flint chat or other similarly hard, durable, dry aggregate with less than 0.2 percent moisture. Aggregate shall be in accordance with the following gradation:

Sieve Size	% Passing By Weight
No. 4	100
No. 20	0 – 5
No. 200	0 – 1.0

2.3.1 Lead Content. Aggregate produced as a by-product from lead or zinc mining operations shall not have a total lead content greater than 4,500 ppm, as determined by EPA Method 3050A, "Acid Digestion of Sediments, Sludges and Soils". Suppliers of this aggregate shall provide certification to the engineer for each shipment that the total lead content of the aggregate does not exceed this value and attach a typical test report from the same source no older than 12 months prior to the shipment.

2.3.2 Aggregate Recommendation. For each contract, the epoxy urethane polymer supplier shall supply a letter to the engineer specifically recommending the use of a designated aggregate and source, which has been previously approved by Construction and Materials.

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2.3.3 Epoxy Urethane Polymer Performance. The epoxy urethane polymer system shall not exhibit shearing, shrinkage, expansion or scaling.

2.3.4 Test Methods. Tests will be performed in accordance with the following methods:

Test Methods	
Rotational Viscosity	ASTM D 2393 Model LVT Brookfield viscometer
Epoxy Equivalent	MoDOT Test Method TM 73
Filler Content	MoDOT Test Method TM 73
Pot Life	AASHTO T 237
Elongation	ASTM D 638
Tensile Strength	ASTM D 638
Compressive Strength	ASTM C 881
Water Absorption	ASTM D 570
Thermal Shear	MoDOT Test Method TM 72

2.3.5 Manufacturer and Brand Name Approval. Prior to approval and use of this material, the manufacturer shall submit to Construction and Materials a certified test report showing specific test results in accordance with all requirements of this specification. The certified test report shall include the manufacturer's name, brand name of material, lot tested, date of manufacture, ratio of components by volume and system tested. In addition, the manufacturer shall submit to Construction and Materials a sample representing the system for laboratory testing accompanied by a technical data sheet, an MSDS and any special installation instructions relative to the system being submitted. Upon approval of the certified test report and satisfactory results of tests performed on the sample submitted, the brand name and manufacturer will be placed on a qualified list of epoxy resin material for epoxy urethane polymer concrete wearing surface. New certified test results and samples shall be submitted any time the manufacturing process or the material formulation is changed and may be required when random sampling and testing of material offered for use indicates non-conformity with any of the requirements herein specified.

2.3.6 Product History. The epoxy urethane polymer shall have a proven record of a minimum of two years on similar bridge decks within the United States. A list including the location, the name of the agency involved with the project, and a name and phone number of a contact person with that agency shall be provided for each location used as evidence of satisfactory use.

2.3.7 Acceptance. The manufacturer shall furnish certification to the engineer at the destination that the material supplied is in accordance with all requirements specified and stating that the material supplied is the same system and is identically formulated to the material tested for manufacturer and brand name approval. Acceptance will be based on certification and testing.

3.0 Construction Requirements.

3.1 Manufacturer Representation. The wearing surface manufacturer's representative shall witness the entire testing phase of each field test. The manufacturer's representative shall verify that all operations are performed by acceptable practices.

3.2 Handling and Storage of Material. Handling and storage of material shall be in accordance with the manufacturer's written recommendations.

JOB SPECIAL PROVISIONS (BRIDGE)

3.3 Field Test. Prior to the start of the wearing surface operation, a test area of the complete wearing surface system shall be placed on the bridge deck in a contractor proposed location that is approved by the engineer. When multiple bridges are included in a project, a test area will be required on each bridge. The contractor may utilize one-half of the bridge deck or an area equal to one day's placement operation, whichever is smaller, as a field test. The degree of cleaning used on the test area shall be the minimum used on the remainder of the structure. The surface for the test wearing surface shall be prepared in accordance with the test method prescribed in ACI 503R - Appendix A of the ACI Manual of Concrete Practice to establish an approved cleaning practice. The approved cleaning practice shall remove all potentially detrimental material which may interfere with the bonding or curing of the wearing surface. Concrete shall be sound, with mortar soundly bonded to the coarse aggregate, with clean and open pores to be considered adequate for bond. All areas of asphalt and pavement markings shall be removed. Preparation of the surface shall produce a surface relief equal to International Concrete Repair Institute (ICRI) surface preparation level 6 or 7 or ASTM E 965 pavement macrotexture depth of 0.04 to 0.08 inch.

3.3.1 Visible moisture on the prepared deck at the time of placing the wearing surface will not be permitted. Moisture in the deck shall be checked by taping a plastic sheet to the deck for a minimum of 2 hours in accordance with ASTM D 4263.

3.3.2 In addition to the above requirements, the cleaning practice shall provide an adhesion strength test result greater than 250 psi or a failure area into the base concrete that is greater than 50 percent of the test area. After the test area has cured for a minimum of 72 hours, adhesion shall be checked in accordance with ACI 503R. A test result will be the average of three tests on a sample area of the test patch. A minimum of three sample areas per test patch shall be tested. Successful test results will be required from each sample area.

3.3.3 If the test of a sample area fails to meet the above requirements due to a cohesive failure of the substrate concrete, the adhesive strength of the sample area will be considered acceptable.

3.3.4 Successful completion of the adhesion strength tests will be required before the full-scale wearing surface operation is to begin. All cleaning operations shall equal those used for the adhesion strength test areas in both profile and cleanliness. If changes are made to the established cleaning practice, new adhesion strength testing shall be performed at the contractor's expense.

3.3.5 Test patches shall be installed with the same material, equipment, personnel, timing, sequence of operations and curing period that will be used for the installation of the wearing surface.

3.3.6 If the test fails, the contractor shall remove the material represented by the failed test patches and provide another test patch, at the contractor's expense, until satisfactory test results are obtained.

3.4 Surface Preparation. Before placement of the wearing surface, the entire deck surface shall be prepared by the cleaning practice established in the field adhesion strength tests in accordance with section 3.3 of this job special provision by shot blast method. Sand blasting will not be permitted. Clean-up and disposal of blast material shall be in accordance with [Sec 202.3.1.3](#).

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3.4.1 If the engineer determines that the weather has changed significantly since the application of the field test patch, the contractor shall verify through adhesion strength tests that the practice is acceptable, at the contractor's expense.

3.4.2 No traffic of any kind shall be permitted on any portion of the deck which has been shot blasted or on the wearing surface without approval from the engineer. The time between surface preparation and application of the first course shall not exceed 24 hours.

3.4.3 All patching and cleaning operations shall be inspected and approved prior to placing the wearing surface.

3.4.4 If the deck or intermediate course is contaminated by foreign material or water after initial cleaning, the contamination and any detrimentally affected wearing surface material shall be removed. Both courses shall be applied prior to opening the area to traffic.

3.5 Equipment. The contractor's equipment shall be as recommended by the epoxy urethane manufacturer.

3.6 Epoxy Mixing. Mixing of epoxy urethane polymer components shall be in accordance with the manufacturer's recommendations, except that the use of a volumetric mixer will be required. When mineral fillers are specified, the mineral fillers shall be inert and non-settling or readily dispersible. Material showing a permanent increase in viscosity or the settling of pigments that cannot be readily dispersed with a paddle shall be replaced at the contractor's expense. At least 95 percent of the filler shall pass the No. 200 sieve.

3.7 Application. Application of epoxy urethane polymer shall be performed by the manufacturer or by a factory trained or licensed applicator with written approval from the manufacturer of the epoxy system.

3.7.1 The handling and mixing of epoxy urethane polymer shall be in accordance with the manufacturer's written recommendations. The epoxy urethane polymer shall not be placed when weather or surface conditions are such that the material cannot be properly handled, placed and cured within the specified requirements of traffic control, or when rain is forecast within 24 hours of application.

3.7.2 The wearing surface shall consist of a two-course application of epoxy urethane polymer and aggregate. A healer/sealer prime coat shall be used as specified on the plans or if recommended by the manufacturer. Each of the two courses shall consist of a layer of epoxy urethane polymer covered with a layer of aggregate in sufficient quantity to completely cover the epoxy urethane polymer. The thickness of each course shall be approximately equal. The total thickness of the wearing surface shall be no less than 1/4 inch.

3.7.3 The temperature of the bridge deck surface at the time of application shall be less than 90 F and in accordance with the manufacturer's recommendation.

3.7.4 Dry aggregate shall be applied in such a manner as to cover the epoxy urethane polymer completely within five minutes of application. The dry aggregate shall be placed in a manner such that the level of the epoxy urethane polymer is not disturbed.

3.7.5 The first course shall be swept to remove loose aggregate prior to the second course application. Sweeping shall be performed without removing embedded aggregate. First course

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applications which do not receive enough aggregate prior to gelling shall be removed and replaced. A second course applied with insufficient aggregate may be left in place, but additional applications shall be placed at the contractor's expense before opening to traffic.

3.7.6 The thickness of the wearing surface shall be verified to be at least 1/4 inch, measured from the deck surface to the top of the epoxy urethane polymer. The contractor shall provide a minimum 1/2-inch diameter hole at a rate of at least one hole per 100 feet of traffic lane. Hole placement shall be at locations designated by the engineer. Thin areas shall be recoated and reverified at the contractor's expense.

3.7.7 When additional applications or recoating are required, the engineer may require additional adhesion strength tests by the contractor, at the contractor's expense, in accordance with ACI 503R to verify the contractor's procedure.

3.7.8 All adhesion strength test areas, thickness test holes or any debonded areas shall be repaired by filling them with wearing surface material before final acceptance.

3.7.9 The first epoxy urethane polymer course shall be cured at least one hour or until brooming or vacuuming can be performed without tearing or otherwise damaging the surface. No traffic or equipment shall be permitted on the first course surface during the curing period.

3.7.10 After the curing period, all loose aggregate shall be removed by brooming or vacuuming and the next epoxy urethane polymer course applied as specified in the contract documents.

3.7.11 The epoxy urethane polymer mixture shall not be permitted to run into drains.

3.7.12 Unless otherwise specified, the epoxy urethane polymer courses shall be applied over the expansion joints and joint seals of the bridge deck. The expansion joints and joint seals shall be provided with a bond breaker. Prior to opening to traffic, the wearing surface shall be removed over each joint by removal of the bond breaker in accordance with the epoxy urethane polymer manufacturer's recommendations.

3.7.13 Prior to opening a section to public or construction traffic, the wearing surface shall be allowed to cure in accordance with the manufacturer's recommendations. First course applications shall not be opened to traffic.

3.7.14 Damaged or debonded areas of an epoxy urethane polymer course shall be removed and repaired prior to acceptance. Repair shall consist of saw-cutting in rectangular sections to the top of the concrete deck surface and replacing the various courses in accordance with this job special provision at the contractor's expense.

4.0 Method of Measurement. Final measurement will not be made except for authorized changes during construction or where appreciable errors are found in the contract quantity. Where required, the area of epoxy urethane polymer wearing surface will be measured to the nearest square yard based on measurement longitudinally from end to end of bridge deck and transversely between roadway face of curbs, excluding the area of any expansion devices. The revision or correction will be computed and added to or deducted from the contract quantity.

5.0 Basis of Payment. The accepted quantity of epoxy urethane polymer wearing surface with healer/sealer will be paid for at the contract unit price. Payment will be considered full compensation for all labor, equipment and material necessary to complete the described work.

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E. SEGMENTAL EXPANSION JOINT SYSTEM

1.0 Description. This work shall consist of fabricating, furnishing and installing a bridge deck joint sealing system in accordance with the details shown on the plans and the requirements of these special provisions.

2.0 Product. A watertight joint sealing system that can accommodate the structure's movement shall be provided. The joint sealing system shall consist of elastomeric molded neoprene panels that are reinforced with structural steel angles and embedded wear plates. The system shall be cast into the structure by cast-in-place anchors. The elastomeric panels shall be designed to withstand traffic loads. The panel size shall satisfy project requirements including movement and watertightness. All components shall be installed utilizing the manufacturer's recommended sealants for complete installation.

3.0 Component and Materials. The contractor shall furnish a manufacturer's certification that the materials proposed have been pre-tested and shall be in accordance with these special provisions.

3.1 Elastomeric Molded Panels.

3.1.1 The 6-foot elastomeric molded panels (4-foot for SR 13) shall be comprised of a formed steel shape suspended in an elastomeric material. The profile-riding surface shall have embedded wear plates to ensure skid resistance and shall be capable of accommodating traffic loads. Each elastomeric molded panel shall be supplied with integrated bolt hole cavities and tongue and groove end connections.

3.1.2 The elastomer used to mold the panels shall be manufactured of a neoprene compound exhibiting the physical properties listed in the table below:

PHYSICAL PROPERTIES	TEST METHOD	REQUIREMENT
Hardness, Type A Durometer	ASTM D 2240 modified	45 +/- 5 points
Tensile Elongation	ASTM D 412	1800 psi, min.
Elongation at Break	ASTM D 412	400%, min.
Compression set, 22 hrs at 158°F	ASTM D 395 Method B	20%, max.
Low Temperature at -40°F	ASTM D 746	Not Brittle
Ozone Resistance, 70 hrs at 100°F, 20% strain, 100 pphm	ASTM D 1149 Method B	No Cracks
Oil Deterioration 70 hrs at 212°F, ASTM D 471 after Immersion in ASTM Oil #3		120% volume increase, max.
Requirements shown reflect test results taken immediately following compound mixing. Results may vary and are not indicative of product performance if specimens are skived from finished, molded parts.		

3.2 Wear Plate. Wear plate material utilized for skid-resistant surface shall be from alloy 6061-T6 (ASTM B 221-73).

3.3 Steel Angle. The steel angles embedded in the molded neoprene panels shall be formed from ASTM A36 steel.

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3.4 Bolt Cavity Sealant. Bolt hole cavities shall be filled using a two-part polyurethane sealant that meets Federal Specification TT-S-00227E. The contractor shall ensure that the anchor blocks are dry from moisture prior to placement of material.

3.5 Edge Void Sealant. Edge voids shall be filled with a one-part polysulfide base synthetic rubber sealant in accordance with Federal Specification TT-S-00230C Type II Non-Sag. Contractor shall ensure that the edge voids are dry from moisture prior to placement of material.

3.6 Bedding Compound. Edge void sealant shall be applied as a bedding material to the blockout base prior to placement of the elastomeric gland. Material shall be a one-part polysulfide base synthetic rubber sealant in accordance with Federal Specification TT-S-00230C Type II Non-Sag. Contractor shall ensure that the blockouts are dry from moisture prior to placement of material.

4.0 Construction Requirements.

4.1 The contractor shall submit product information and necessary shop drawings in accordance with Sec 1080 after the award of the contract. At the discretion of the engineer, the manufacturer may be required to furnish a representative sample of material to be supplied in accordance with the project specifications.

4.2 The device shall be accurately set and securely supported at the correct grade and elevation and the correct joint opening as shown on the plans and on the shop drawings.

4.3 The manufacturer's instructions for the proper installation of the joint system shall be entered on the shop drawings. Shop drawings which lack manufacturer installation instruction may be returned without approval.

4.4 Installation and Certification. The contractor shall obtain the services of a qualified technical representative, approved by the manufacturer of the expansion joint system and acceptable to the engineer, to assist during the installation. The installation shall not occur without the technical representative being present. The technical representative shall provide certification that the joint system delivered and the installation are in accordance with the plans and project specifications.

5.0 Method of Measurement. Final measurement will not be made except for authorized changes during construction or where significant errors are found in the contract quantity. Where required, the expansion joint will be measured to the nearest linear foot based on measurement from roadway face of barrier to roadway face of barrier along the centerline of the joint. The revision or correction will be computed and added to or deducted from the contract quantity. No measurement will be made of portions of the joint that extend past or up the roadway face of barriers.

6.0 Basis of Payment. The accepted quantity of segmental expansion joint system, including all material, coating, equipment, labor, fabrication, installation, technical assistance, certification, and any other incidental work necessary to complete this work, will be paid for at the contract unit price per linear foot for Segmental Expansion Joint System.

F. SEGMENTAL EXPANSION JOINT SYSTEM (SIDEWALK)

JOB SPECIAL PROVISIONS (BRIDGE)

1.0 Description. This work shall consist of fabricating, furnishing and installing a sidewalk joint sealing system in accordance with the details shown on the plans and the requirements of these special provisions.

2.0 Product. A hinged, ADA compliant joint sealing system that can accommodate the structure's movement shall be provided. The joint sealing system shall consist of molded elastomeric panels that contain encapsulated steel reinforcing plates. The system shall be attached to the structure by field drilled concrete anchors. The elastomeric panels shall be designed to withstand pedestrian and low-speed (< 10 mph) traffic loads. The panel size shall satisfy project requirements for movement and watertightness. All components shall be installed utilizing the manufacturer's recommended sealants for complete installation.

3.0 Component and Materials. The contractor shall furnish a manufacturer's certification that the materials proposed have been pre-tested and shall be in accordance with these special provisions.

3.1 Rubber Encapsulated Steel Panels.

3.1.1 The elastomeric steel panels come in 6-foot (SFP-600 & SFP-1000), 5-foot (SFP-1200, SFP-1800 & SFP-2400) and 4-foot (SFP-3100). Panels shall be comprised of a steel plate suspended in an elastomeric material. The steel plates integral to the elastomeric cover allows the system to flex due to vertical displacements (SFP-1200 or larger).

3.1.2 The elastomer used to mold the panels shall be manufactured of a Ethylene Propylene Diene Monomer (EPDM) compound exhibiting the physical properties listed in the table below:

PHYSICAL PROPERTIES	TEST METHOD	REQUIREMENT
Tensile Strength, min	ASTM D 412	1500 psi
Hardness, Shore A	ASTM D 2240	65 +/- 5
Elongation at Break	ASTM D 412	250%, min.
Heat Resistance 70hrs @ 212°F Tensile strength, max Elongation, max Hardness, max	ASTM D 573	25% 25% 10 pts
Compression Set 22 hrs @ 212°, max	ASTM D 395	50%
Ozone Resistance 50 pphm for 72 hrs @ 104°F	ASTM D 1149	100 rating
Oil Resistance 70 hrs at 212°F, Volume, max	ASTM D 471	120%
Requirements shown reflect test results taken immediately following compound mixing. Results may vary and are not indicative of product performance if specimens are skived from finished, molded parts.		

3.2 Steel Plate. Steel plate material shall be ASTM A588.

3.3 Void Sealant. Voids for recessed condition installation shall be filled with a multi-part polyurethane base synthetic sealant in accordance with Federal Specification TT-S-00227E, Type

JOB SPECIAL PROVISIONS (BRIDGE)

I, Class A. Contractor shall ensure that the voids are dry and free from moisture prior to placement of material.

4.0 Construction Requirements.

4.1 The contractor shall submit product information and necessary shop drawings in accordance with Sec 1080 after the award of the contract. At the discretion of the engineer, the manufacturer may be required to furnish a representative sample of material to be supplied in accordance with the project specifications.

4.2 The device shall be accurately set and securely supported at the correct grade and elevation and the correct joint opening as shown on the plans and on the shop drawings.

4.3 The manufacturer's instructions for the proper installation of the joint system shall be entered on the shop drawings. Shop drawings which lack manufacturer installation instruction may be returned without approval.

4.4 Installation and Certification. The contractor shall obtain the services of a qualified technical representative, approved by the manufacturer of the sidewalk joint system and acceptable to the engineer, to assist during the installation. The installation shall not occur without the technical representative being present. The technical representative shall provide certification that the joint system delivered and the installation are in accordance with the plans and project specifications.

5.0 Method of Measurement. Final measurement will not be made except for authorized changes during construction or where significant errors are found in the contract quantity. Where required, the expansion joint will be measured to the nearest linear foot based on measurement from roadway face of barrier to roadway face of barrier along the centerline of the joint or from dimensions as shown on the plans. The revision or correction will be computed and added to or deducted from the contract quantity. No measurement will be made of portions of the joint that extend past or up the roadway face of barriers.

6.0 Basis of Payment. The accepted quantity of segmental expansion joint system, including all material, coating, equipment, labor, fabrication, installation, technical assistance, certification, and any other incidental work necessary to complete this work, will be paid for at the contract unit price per linear foot for Segmental Expansion Joint System (Sidewalk).